EVIDENCE SUMMARY

RESEARCH QUESTION: Among COVID-19 patients, should remdesivir be used for treatment?

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RECOMMENDATIONS

Recommendations	Certainty of Evidence	Strength of Recommendation
We suggest the use of remdesivir among hospitalized adult patients with mild to moderate COVID-19 infection with at least 1 risk factor* for progression to severe disease. *60 years old or older, hypertension, cardiovascular or cerebrovascular disease, diabetes mellitus, obesity (a body-mass index [BMI; the weight in kilograms divided by the square of the height in meters] of ≥30), immune compromise, chronic mild or moderate kidney disease, chronic liver disease, chronic lung disease, current cancer, or sickle cell disease	Low	Weak
We recommend the use of remdesivir among non-hospitalized adult patients with mild to moderate COVID-19 infection with at least 1 risk factor* for progression to severe disease. *60 years old or older, hypertension, cardiovascular or cerebrovascular disease, diabetes mellitus, obesity (a body-mass index [BMI; the weight in kilograms divided by the square of the height in meters] of ≥30), immune compromise, chronic mild or moderate kidney disease, chronic liver disease, chronic lung disease, current cancer, or sickle cell disease	Moderate	Strong
We suggest the use of remdesivir in children (hospitalized or ambulatory) with mild to moderate COVID-19 infection with at least 1 risk factor for disease progression.	Very low	Weak
We suggest the addition of remdesivir to dexamethasone in adult patients with COVID-19 infection requiring oxygen supplementation but do not require mechanical ventilation*. *For patients who progress to invasive mechanical ventilation while on remdesivir, the drug can be continued.	Low	Weak
We suggest the addition of remdesivir to dexamethasone in children with COVID-19 infection requiring oxygen supplementation but do not require mechanical ventilation.	Very low	Weak
We suggest against the use of remdesivir among adult patients with COVID-19 infection who are already on non-invasive or invasive mechanical ventilation.	Low	Weak

We suggest against the use of remdesivir among children with COVID-19 infection who are already on non-invasive or invasive mechanical ventilation.	Very low	Weak

Consensus Issues

The panel issued separate recommendations for hospitalized and non-hospitalized adult patients with mild to moderate COVID-19, mainly due to different treatment duration (3 days for non-hospitalized vs 5 days for hospitalized) and critical outcomes measured (need for hospitalization or ER visit for non-hospitalized; need for mechanical ventilation and clinical deterioration for hospitalized). Like other antivirals, benefit of remdesivir is expected to be greater if given early in the disease course. Outpatients are more likely to receive remdesivir early in their disease course, hence are more likely to benefit from the drug's antiviral activity. This is in contrast to hospitalized patients who are more likely to receive remdesivir during the latter phase of their disease course. However, the panel also considered the high resource requirements in giving remdesivir to outpatients with mild to moderate COVID-19. The three-day regimen will require intravenous home infusions or multiple visits to the emergency room for the infusion.

With the introduction of vaccines against COVID-19, patients are more likely to have mild to moderate COVID-19, not requiring admission unless with risk factors for disease progression. The panel recognized that there are instances wherein adult patients are admitted due to other condition(s) and incidentally have mild-moderate COVID-19 infection as well. The panel believed that since there is evidence supporting use of remdesivir in hospitalized patients with mild to moderate COVID-19, this treatment option ought to be made available to this subgroup of patients, albeit low certainty of evidence. Only 1 of the 10 RCTs excluded vaccinated patients (outpatient study) while the rest did not mention the participants' vaccination status, since most RCTs on hospitalized COVID-19 patients were done early in the COVID-19 pandemic and prior to vaccine rollout. Hence, the panel did not include vaccination status as one of the qualifiers in the current recommendations.

The panel did not specify age in the recommendations for children, because randomized controlled trials (RCTs) specific to the pediatric population are still lacking. There was only 1 RCT on outpatients which explicitly reported inclusion of 8 adolescents (12-18 years old). Hence, the recommendations for children were extrapolated from adult studies and certainty of evidence was further downgraded due to indirectness. Recommendations from other groups vary, depending on the country's regulatory approval. US NIH recommends remdesivir for children 12 to 17 years of age, while Australian COVID-10 guidelines states that remdesivir may be given to children at least 28 days old and weighing at least 3kg.

KEY FINDINGS

- A total of 10 RCTs on the use of remdesivir in treatment of COVID-19 were included in this review.
- Remdesivir showed significant benefit for outpatients with mild to moderate disease with at least one risk factor for disease progression in terms of COVID 19-related and all-cause hospitalizations, and need for medically-attended visits.
- For hospitalized patients, remdesivir had a slight benefit in reducing all-cause mortality at day 28.
- Subgroup analysis by disease severity showed a trend towards reduction in mortality among those with severe disease, with no effect on those with critical disease and inconclusive effect for those with mild-moderate disease.
- Subgroup analysis by oxygen requirement showed trend towards mortality reduction for patients on low and high flow oxygen, and a trend towards increased mortality for those on mechanical ventilation.
- There was inconclusive effect on those without oxygen support.
- Remdesivir showed benefit in decreasing clinical deterioration, improving recovery rate, and reducing the need for mechanical ventilation.
- There was inconclusive effect on the need for ICU admission.
- No increased risk of adverse events, including serious adverse events, was seen.

- The overall certainty of evidence was low due to serious risk of bias AND inconsistency or imprecision in several critical outcomes.

WHAT'S NEW IN THIS VERSION?

This update contains the final results of the WHO solidarity trial and the DisCoVeRy trial.

PREVIOUS RECOMMENDATIONS
As of 19 February 2021

We suggest against the use of remdesivir in patients with COVID-19 infection who have O_2 saturation ≥94% and do not require oxygen supplementation. *(Low certainty of evidence; conditional recommendation)*

We suggest the addition of remdesivir to dexamethasone in patients with COVID-19 infection who have O2 saturation <94% and/or requiring oxygen supplementation*. *(Low certainty of evidence; conditional recommendation)*

*For patients who progress to invasive mechanical ventilation while on remdesivir, the drug can be continued.

We suggest against the use of remdesivir in patients with COVID-19 infection who are already on invasive mechanical ventilation. *(Low certainty of evidence; Conditional recommendation).*

We suggest the use of remdesivir in hospitalized children with severe COVID-19 infection. *(Very low certainty of evidence; Weak recommendation)*

We suggest the use of remdesivir in non-hospitalized children with COVID-19 infection with at least 1 risk factor for disease progression. *(Low certainty of evidence; weak recommendation)*

Previous Consensus Issues
Consensus Panel for Adult COVID-19
Early introduction of remdesivir in the treatment of COVID-19 is preferred because of its action on the polymerase resulting to less viral replication. Remdesivir is a relatively safe drug, however, its cost should be considered. Hence, routine use of the drug is not recommended. There are 26 ongoing trials pertaining to the efficacy and safety of remdesivir for the treatment of COVID-19.

Consensus Panel for Pediatric COVID-19
The recommendations were based on the evidence from one observational study among pediatric patients and 10 randomized controlled trials among patients aged 12 years old and above.

Despite the very low certainty of evidence for hospitalized children, the panel voted for the use of remdesivir. This is due to the significant benefit in decreasing the risk for clinical deterioration (based on WHO progression scale) and the risk reduction in mechanical ventilation use, although this was not statistically significant. The panel also agreed that because there are very limited treatment options for pediatric patients with COVID-19, this would give better guidance to clinicians. The panel emphasized though that remdesivir should be used for pediatric patients with severe COVID-19 following the classification of PIDSP and PSMID (on low flow oxygen support).

The panel voted for the use of remdesivir in non-hospitalized children with COVID-19 infection based on the evidence from one double-blind, placebo-controlled randomized controlled trial done among patients aged 12 years old and above. This study showed significant benefit in preventing COVID-19 related hospitalization or all-cause mortality. Remdesivir was given to the patients 7 days from symptom onset and to those with at least one of the following risk factors: hypertension, cardiovascular or

cerebrovascular disease, diabetes mellitus, obesity, immune compromise, chronic mild or moderate kidney disease, chronic liver disease, chronic lung disease, current cancer or sick cell disease.

INTRODUCTION

Remdesivir is an intravenously administered antiviral drug originally developed for the Ebola virus that is currently being evaluated as a potential treatment for COVID-19. It is a nucleotide analogue that inhibits RNA-dependent RNA polymerase [1]. In vitro studies and studies in animal models have demonstrated its antiviral activities against an array of RNA viruses (e.g., MERS-CoV, Ebola, and SARS-CoV) [2-4]. An in vitro study has shown that remdesivir can inhibit the growth of the COVID-19 virus in infected Vero cells and can inhibit infection in human cell lines [5].

REVIEW METHODS

A systematic search was done from the date of last search January 26, 2022 until September 4, 2022 in Medline, Cochrane Library, and MedRivx. We used a combined MeSH and free text search using the terms coronavirus infections, COVID-19, severe acute respiratory syndrome coronavirus 2 or SARS-CoV-2, and remdesivir. We also looked at the COVID-NMA Living Data and searched for ongoing studies in the NIH *clinicaltrials.gov* and various trial registries. Randomized controlled trials on remdesivir compared to placebo or standard of care in the treatment of COVID-19, regardless of severity and age, were included. A few meta-analysis from the COVID-NMA was adopted in this review. Subgroup analysis by disease severity and level of oxygen requirement was planned. For studies that reported aggregate data on overlapping subgroup categories, the data was placed in the more severe subgroup/higher level of oxygen requirement subgroup.

RESULTS

Characteristics of the included studies

This update includes a total of ten (10) studies covering 13,285 participants [6-16]. Nine of the included studies recruited confirmed COVID-19 patients needing hospitalization, while one study [14] limited recruitment to non-hospitalized patients. The severity of disease of the study participants were mild to critical in four studies, mild to moderate in two studies, mild to severe in one study, moderate to severe in one study, severe in one study, and unclear in one study. All studies involved adult patients. The study on non-hospitalized patients included study participants 12 years old and above, but only 8 participants belonged to the 12 to 18 year old age group. There were no RCTs on children. The median duration of symptoms before randomization and treatment initiation range from 8 to 10 days in five studies [6,8,9,11,15]; while one study reported a 7-day mean duration of symptoms before hospital admission [12]. Only two studies reported recruiting patients within 7 days of symptom onset [13,14]. Studies were mostly conducted in high and upper-middle income countries. Eight RCTs used a 10-day course of remdesivir [6-9,11,12,13,15], two studies used a 5-day course [10,11], and the study in outpatients used a 3-day course [14]. Remdesivir was compared to placebo in 1 study [14], while the rest compared remdesivir to the local standard of care [6-13,15]. Standard of care allowed the use of corticosteroids in seven of the studies [6-7,9-12,15]. Other potential COVID-19 treatments were being investigated in parallel to remdesivir in two multi-arm trials [7,12].

The primary outcome in all studies was all-cause mortality, with duration of follow-up ranging from 24 to 90 days [6-15]. Clinical status or improvement was reported by all studies, using variable 6-, 8-, or 10-point scales. The outcomes of five studies with sufficient description of this outcome measure were converted to the WHO ordinal scale for pooled analysis [6,8-11]. Other outcomes reported were time to clinical improvement or recovery [5,8,9,11], need for mechanical ventilation [7-9,11,12,13,15], duration of hospital stay [7,13,15], need for ICU admission [12], adverse event s[6,8,9,11,13,14,15], and serious adverse events [6,8,9,11,14,15,16]. Characteristics of included studies are summarized in Appendix 2.

Certainty of evidence

The overall certainty of evidence was low due to serious risk of bias AND inconsistency or imprecision in several critical outcomes. The serious risk of bias was due to concerns in selection, performance bias, detection bias, attrition bias, and reporting bias in most of the included studies. The risk of bias summary is in Appendix 3. The GRADE evidence summary is in Appendix 4.

Effectiveness outcomes

Mortality
Among hospitalized patients, pooled results from nine RCTs (N=12,639) showed that remdesivir had slight benefit on all-cause mortality at day 28 (RR 0.90, 95% CI 0.83-0.98; I^2=0%). Sensitivity analysis excluding the studies with very serious risk of bias showed similar results (RR 0.90, 95% CI 0.83-0.98; I^2=0%).

Subgroup analysis: Disease severity
Subgroup analysis by disease severity at baseline showed no significant benefit among patients with mild-moderate disease (RR 0.80, 95% CI 0.55-1.17; I^2=0%). There was a trend towards benefit in reducing mortality among patients with severe disease (RR 0.61, 95% CI 0.35-1.07); however, there was significant heterogeneity (I^2=61%). There was no significant difference in mortality among patients with critical disease (RR 0.96, 95% CI 0.87-1.04; I^2=0%).

A sensitivity analysis was done where patients on low/high flow oxygen from the WHO Solidarity Trial were included in the severe subgroup instead of the critical subgroup. Results similarly showed no significant benefit among patients with mild-moderate disease (RR 0.80, 95% CI 0.55-1.17; I^2=0%), and a trend towards benefit in reducing mortality among patients with severe disease (RR 0.72, 95% CI 0.50-1.03); however, there was significant heterogeneity for the severe disease subgroup (I^2=67%). There was no significant difference in mortality in the critical disease subgroup (RR 1.03, 95% CI 0.90-1.18; I^2=0%).

Subgroup analysis: Oxygen requirement
Subgroup analysis by oxygen requirement at baseline showed no significant benefit among patients without oxygen requirement (RR 0.80, 95% CI 0.55-1.17; I^2=0%). There was a trend towards benefit in reducing mortality among patients on low flow oxygen (RR 0.61, 95% CI 0.35-1.07, I^2=61%) and on high flow oxygen (RR 0.90, 95% CI 0.80-1.00 I^2=0%). Result on low flow oxygen significant heterogeneity. There was a trend towards harm for those on mechanical ventilation (RR 1.06, 95% CI 0.92-1.23; I^2=0%). However, the wide confidence interval in all subgroups precluded definite conclusions to be made.

Subgroup analysis: Treatment duration
Subgroup analysis by treatment duration showed inconclusive effect on mortality for those given a 5-day course of remdesivir (RR 0.98, 95% CI 0.37-2.56; I^2=0%). There was a slight benefit on mortality among those given a 10-day course (RR 0.90, 95% CI 0.83- 0.98; I^2=0%)

Other Outcomes

Four RCTs contributed data for clinical improvement. Pooled analysis showed that remdesivir has marginal benefit on clinical improvement up to day 28 (RR 1.07, 95% CI 1.01-1.13; I^2=0%). Remdesivir may decrease clinical deterioration as measured by the WHO progression scale (RR 0.75, 95% CI 0.62-0.89; I^2=0%). However, no significant effect was seen on time to clinical improvement (RR 1.07, 95% CI 0.91-1.27; I^2=50.7%), with moderate heterogeneity.

Remdesivir has a small benefit in recovery rate (Rate ratio 1.22, 95% CI 1.11-1.35, I^2=0%). On subgroup analysis according to baseline oxygen requirement, there was significant benefit in recovery rate among patients with severe COVID-19 requiring low flow oxygen support (RR 1.45, 95% CI 1.18-1.79). There was no significant benefit for patients not receiving oxygen support (RR 1.16, 95% CI 0.96-1.38), those on high flow oxygen or non-invasive mechanical ventilation (Rate ratio 1.09, 95% CI 0.76-1.57) and on mechanical ventilation or ECMO (Rate ratio 0.98, 95% CI 0.70-1.37).

There was significant reduction in the need for mechanical ventilation among patients given remdesivir (RR 0.72, 95% CI 0.55-0.94); however, there was significant heterogeneity (I^2=76%). There was inconclusive effect in the need for ICU admission (RR 0.98, 95% CI 0.43-2.22; 1 RCT, 181 participants).

Non-hospitalized patients
Among non-hospitalized patients, one RCT (N=562) showed that a 3-day course of remdesivir within 7 days of symptom onset reduced risk of COVID-19 related hospitalization (RR 0.13, 95% CI 0.03-0.59), all cause-hospitalization (RR 0.28, 95% CI 0.10-0.75) and COVID-related medically attended visit (RR 0.19, 95% CI 0.07-0.56) by day 28 compared to placebo. Alleviation of symptoms by day 14 using FLU-PRO Plus questionnaire was inconclusive (RR 1.41, 95% CI 0.73-2.69). None of the patients in both groups died by day 28.

Appendix 5 contains the forest plots for these outcomes.

Safety outcomes
A total of five RCTs (N=4,033) contributed data to the pooled analysis on adverse events among hospitalized patients. Compared to control, patients given remdesivir had no difference in their risk for adverse events (RR 0.99, 95% CI 0.92-1.08; I^2=31%). There was no significant benefit on serious adverse events (RR 0.84, 95% CI 0.65-1.09; I^2=62%).

Among outpatients (1 RCT, N=562), there was no significant difference in adverse events between groups (RR 0.90, 95% CI 0.75-1.09). However, there was a reduced risk of serious adverse events in the remdesivir group (RR 0.26, 95% CI 0.10-0.70).

Common adverse events were pyrexia, rash, anemia, decreased lymphocyte count, increased neutrophil count, hyperglycemia, increased creatinine level, hypoalbuminemia, and decreased glomerular filtration rate. Other adverse events reported include hypersensitivity reactions (angioedema, rash), seizures, and elevations in hepatic enzymes. Serious adverse events reported in both groups were respiratory failure, cardiopulmonary failure, and renal failure necessitating renal replacement therapy.

RECOMMENDATIONS FROM OTHER GROUPS

Table 1. Summary of recommendations from other groups

Regulatory Agency	Recommendation	Strength of Recommendation / Certainty of Evidence
World Health Organization (WHO) (as of September 16, 2022) [19]	We suggest treatment with remdesivir for patients with non-severe COVID-19 at highest risk of hospitalization	Conditional recommendation
	We suggest treatment with remdesivir for patients with severe COVID-19	Conditional recommendation
	We suggest not to use remdesivir for patients with critical COVID-19	Conditional recommendation against
Infectious Diseases Society of America (IDSA) (as of August 30, 2022) [20]	Among patients (ambulatory or hospitalized) with mild-to-moderate COVID-19 at high risk for progression to severe disease, the IDSA guideline panel suggests remdesivir initiated within seven days of symptom onset rather than no remdesivir.	Conditional recommendation, Low certainty of evidence
	In patients on supplemental oxygen but not on mechanical ventilation or ECMO, the IDSA panel suggests treatment with five days of remdesivir rather than 10 days of remdesivir.	Conditional recommendation, Low certainty of evidence
	In hospitalized patients with severe* COVID-19, the IDSA panel suggests remdesivir over no antiviral treatment.	Conditional recommendation, Moderate certainty of evidence

	*Severe illness is defined as patients with SpO2 ≤94% on room air	
	Suggest against the routine initiation of remdesivir in patients on invasive ventilation and/or ECMO.	Conditional recommendation, Very low certainty of evidence
US National Institutes of Health (NIH) (as of August 8, 2022) [21]	The Panel recommends using remdesivir for the treatment of COVID-19 in patients who do not require supplemental oxygen and who are at high risk of progressing to severe disease (Moderate recommendation).	Moderate recommendation
	For patients with COVID-19 who only require minimal conventional oxygen, the Panel recommends using remdesivir without dexamethasone.	Moderate recommendation
	For most patients with COVID-19 who require conventional oxygen, the Panel recommends using dexamethasone plus remdesivir.	Moderate recommendation
	For hospitalized patients who require HFNC oxygen or NIV and have certain medical conditions, the Panel recommends adding remdesivir to 1 of the recommended immunomodulator combinations.	Weak recommendation
	The Panel recommends against the use of remdesivir without immunomodulators in hospitalized patients who require HFNC oxygen or NIV.	Strong recommendation
	The Panel recommends remdesivir, with or without dexamethasone, for hospitalized children who have a new or increasing need for conventional oxygen, and recommends remdesivir in combination with dexamethasone for children who require oxygen through a high-flow device or NIV.	Moderate recommendation
	For children hospitalized for COVID-19 who do not require supplemental oxygen, the Panel recommends remdesivir for children aged 12 to 17 years who are at the highest risk for progression to severe disease.	Weak recommendation
	There is insufficient evidence for or against the use of remdesivir in hospitalized children aged 28 days to <12 years and weighing ≥3kg who do not require supplemental oxygen.	
	Remdesivir, as an alternative to ritonavir-boosted nirmatrelvir, can be considered for children aged ≥12 years who are at the highest risk of progression to severe COVID-19.	Weak recommendation
	For nonhospitalized children aged <12 years who are at the highest risk of progression to severe disease and for children who are at intermediate risk of severe disease, there is insufficient evidence to recommend either for or against the routine use of remdesivir for the treatment of COVID-19.	
Australian COVID-19 Treatment Guidelines (As September 19, 2022) [22]	Consider using remdesivir in adults with COVID-19 who require oxygen but do not require invasive or non-invasive ventilation.	Conditional recommendation
	Do not start remdesivir in adults hospitalized with COVID-19 who require non-invasive or invasive ventilation.	
	Consider using remdesivir within 7 days of symptom onset in unvaccinated adults with COVID-19 who do not require oxygen and who have one or more risk factors* for disease progression. *Risk factors for disease progression include the following:	Conditional recommendation

	• Age ≥60 years • Diabetes • Obesity (BMI ≥30kg/m^2) • Chronic kidney disease (any stage) • Cardiovascular or cerebrovascular disease (coronary artery disease, congenital heart disease, heart failure, cardiomyopathy, or history of stroke) • Hypertension (systemic or pulmonary) • Chronic liver disease • Chronic lung disease (chronic obstructive pulmonary disease, moderate-severe asthma, cystic or pulmonary fibrosis) • Sickle cell disease • Current cancer • Immunocompromised state	
	In addition to at-risk unvaccinated adults, also consider using remdesivir within 7 days of symptom onset in adults with COVID-19 who do not require oxygen and: are immunocompromised regardless of vaccination status; or who are not up-to-date with vaccination and who are at high risk of severe disease on the basis of age and multiple risk factors.	Consensus recommendation
	Consider using, in exceptional circumstances, remdesivir for the treatment of COVID-19 within 7 days of symptom onset in children and adolescents aged 28 days and over and weighing at least 3 kg who do not require oxygen and are at high risk of deterioration, where other treatments are not available / appropriate.	Consensus recommendation
	Consider using remdesivir in eligible children and adolescents who have not received a vaccine dose or had a SARS-CoV-2 infection in the past 6 months, those who are immunocompromised regardless of vaccination / previous infection status, or those who are not eligible for vaccination based on age but who are at high risk of disease progression. Do not routinely use remdesivir in children and adolescents who have received a vaccine dose or had a SARS-CoV-2 infection in the past 6 months unless immunocompromised.	Consensus recommendation

RESEARCH GAPS

As of September 4, 2022, there are 33 registered trials on remdesivir. These upcoming and ongoing trials include trials among adolescents, children, pregnant women, outpatients, and patients with chronic kidney disease (see Appendix 6).

ADDITIONAL CONSIDERATIONS FOR EVIDENCE TO DECISION (ETD) PHASE

COST

Remdesivir is available in the Philippines as 100mg of lyophilized powder for reconstitution in a single-use vial, under a compassionate special permit (CSP) for use in the treatment of COVID-19 [17]. The suggested retail price specified in a DOH memorandum is up to ₱8,200 per 100mg vial [18]. Using the dosing of 200mg IV on Day 1 and 100mg IV on Days 2 to 10 for a 10-day course, the total cost per patient (at the SRP) is ₱90,200.00.

PATIENT'S VALUES AND PREFERENCE, EQUITY, ACCEPTABILITY, AND FEASIBILITY

Remdesivir has been granted emergency use authorization by the US FDA for the treatment of COVID-19 in adults and children aged ≥28 days and weighing ≥3kg.

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Appendix 1: Preliminary Evidence to Decision

Table 1. Summary of initial judgements prior to the panel discussion (N=8/10)

FACTORS	JUDGEMENT						RESEARCH EVIDENCE/ADDITIONAL CONSIDERATIONS
Problem	No	Yes (8)					• Yes, COVID-19 has affected millions of people worldwide and has caused substantial mortality and morbidity.
Benefits	Large (2)	Moderate (2)	Small (2)	Trivial	Varies (2)	Uncertain	• Among hospitalized patients, remdesivir had **slight benefit on all-cause mortality at day 28** (RR 0.90, 95% CI 0.83, 0.98; I2 = 0%), with **trend towards mortality reduction among patients on low-flow oxygen supplementation and on high flow oxygen**. Remdesivir has **marginal benefit on clinical improvement up to Day 28** (RR 1.07, 95% CI 1.01 - 1.13). Remdesivir may **decrease clinical deterioration as measured by the WHO progression scale** (RR 0.75, 95% CI 0.62, 0.89) and **need for mechanical ventilation (**RR 0.72, 95% CI 0.55, 0.94). • Among non-hospitalized patients, a 3-day course of remdesivir within 7 days of symptom onset **reduced risk of COVID-19 related hospitalization** (RR 0.13, 95% CI 0.03, 0.59), all cause-hospitalization (RR 0.28, 95% CI 0.10, 0.75) and **COVID-related medically attended visit** (RR 0.19, 95% CI 0.07, 0.56) by day 28 compared to placebo. Alleviation of symptoms by day 14 using FLU-PRO Plus questionnaire was inconclusive (RR 1.41, 95% CI 0.73, 2.69). None of the patients in both groups died by day 28.

Harm	Large	Moderate (3)	Small (4)	Trivial	Varies (1)	Uncertain	• Among hospitalized patients, **remdesivir showed no effect on adverse events of any grad**e (RR 0.99, 95% CI 0.92 - 1.08) and **no significant difference in serious adverse events** (RR 0.84, 95% CI 0.65 - 1.09). • Among non-hospitalized patients, **remdesivir had no significant effect on adverse event**s (RR 0.90, 95% CI 0.75,1.09) but was associated with a **reduced risk of serious adverse events** (RR 0.26, 95% CI 0.10-0.70).
Certainty of Evidence	High	Moderate (8)	Low	Very low			• The overall certainty of evidence was low due to **serious risk of bias AND inconsistency or imprecision in several critical outcomes**. The serious risk of bias was due to concerns in selection, performance bias, detection bias, attrition bias, and reporting bias in most of the included studies.
Balance of effects	Favors intervention (1)	Probably favors intervention (6)	Does not favor intervention	Probably favors no intervention	Favors no intervention	Varies (1)	• **Net potential benefit for outpatients with mild to moderate COVID-19 infection with at least 1 risk factor for progression to severe disease.** • Among hospitalized patients, remdesivir may have **potential benefit for patients requiring low flow or high flow O2 supplementation**, but net potential harm for patients requiring mechanical ventilation.
Values	Important uncertainty or variability	Possibly important uncertainty or variability (5)	Probably no important uncertainty or variability (3)	No important uncertainty or variability			• No research evidence
Resources Required	Uncertain	Large costs (6)	Moderate costs (2)	Negligible cost or savings	Moderate savings	Large savings	• Remdesivir is available in the Philippines as 100 mg of lyophilized powder for reconstitution in a single-use vial, under a compassionate

							special permit (CSP) for use in the treatment of COVID-19. • The suggested retail price specified in a DOH memorandum is up to **PhP 8,200 per 100 mg vial**. However, there have been reports of remdesivir being sold at up to PhP 30,000 per 100 mg vial. Using the dosing of 200 mg IV on Day 1 and 100 mg IV on Days 2 - 10 for a 10 day course, the total cost per patient (at the SRP) is PhP 90,200.00. • Remdesivir has been granted emergency use authorization by the US FDA for the treatment of COVID-19 in adults and children.
Certainty of evidence of required resources	No included studies (1)	Very low (2)	Low (2)	Moderate (2)	High (1)		• The suggested retail price is from a DOH memorandum.
Cost effectiveness	No included studies (4)	Favors using the comparison (1)	Probably favors the comparison	Does not favor either the intervention or the comparison	Probably favors the invention (2)	Favors the intervention (1)	No research evidence
Equity	Uncertain	Varies (3)	Probably reduced (1)	Reduced (1)	Probably increased (2)	Increased (1)	No research evidence
Acceptability	Uncertain	Varies (4)	No	Probably no (1)	Probably yes (3)	Yes	
Feasibility	Uncertain	Varies (3)	No	Probably no (1)	Probably yes (4)	Yes	

Appendix 2: Search Strategy and Results

DATABASE	SEARCH STRATEGY / SEARCH TERMS	DATE AND TIME OF SEARCH	RESULTS	
			Yield	Eligible
Medline https://pubmed.ncbi.nlm.nih.gov/	{“Coronavirus Infections”[Mesh] OR “Coronavirus”[Mesh] OR coronavirus OR novel coronavirus OR NCOV OR “COVID-19” [Supplementary Concept] OR covid19 OR covid 19 OR covid-19 OR “severe acute respiratory syndrome coronavirus 2” [Supplementary Concept] OR severe acute respiratory syndrome coronavirus 2 OR SARS2 OR SARS 2 OR SARS COV2 OR SARS COV 2 OR SARS-COV-2} AND (remdesivir) Filters: January 01, 2022 to September 4, 2022	4 September 2022, 1500	387	1
CENTRAL https://www.cochranelibrary.com/1dvanced-search	MeSH descriptor: [Coronaviridae Infections] explode all trees OR MeSH descriptor: [Coronavirus] explode all trees OR coronavirus OR novel coronavirus OR NCOV OR covid19 OR covid 19 OR covid-19 OR severe acute respiratory syndrome coronavirus 2 OR SARS2 OR SARS 2 OR SARS COV2 OR SARS COV 2 OR SARS-COV-2} AND (remdesivir) Filters: January 2022 to September 4, 2022	4 September 2022, 1500	87	1
COVID-NMA initiative https://covid-nma.com/	(remdesivir)	4 September 2022, 1500	14	0
Ongoing trials				
ClinicalTrials.gov https://clinicaltrials.gov/	covid19 OR covid 19 OR covid-19 OR severe acute respiratory syndrome coronavirus 2 OR SARS2 OR SARS 2 OR SARS COV2 OR SARS COV 2 OR SARS-COV-2} AND (remdesivir)	4 September 2022, 1500	118	32
Chinese Clinical Trial Registry http://www.chictr.org.cn/searchprojen.aspx	remdesivir	4 September 2022, 1500	0	0

EU Clinical Trials Register https://www.clinicaltrialsregister.eu/	covid 19 AND remdesivir	4 September 2022, 1500	3	1
Republic of Korea – Clinical Research Information Service https://cris.nih.go.kr/cris/info/introduce.do?search_lang=E&lang=E	remdesivir	4 September 2022, 1500	0	0
Japan Primary Registries Network/ NIPH Clinical Trials Search https://rctportal.niph.go.jp/en/	remdesivir	4 September 2022, 1500	8	0
CenterWatch https://www.centerwatch.com/clinical-trials/listings/	remdesivir	4 September 2022, 1500	20	2
Preprints				
chinaxiv.org	remdesivir	4 September 2022, 1500	0	0
Medrxiv.org	Remdesivir Filters: January to September 4, 2022	4 September 2022, 1500	201	0
Biorxiv.org	Remdesivir Filters: January to September 4, 2022	4 September 2022, 1500	83	0

Appendix 3: Characteristics of Included Studies

Title/ Author	Country	Number of patients	Population	Intervention group(s)	Control	Outcome/s
Wang, 2020 [6]	China	237 randomized, 226 evaluated	Severe COVID-19 patients Follow-up time: up to Day 28	Remdesivir 200 mg IV on D1, followed by 100 mg IV on D2 – D10	Placebo	Clinical status (6-point ordinal scale) Clinical improvement (2 points reduction from baseline, or discharge from hospital) Time to clinical improvement Viral load Mortality Adverse events
WHO Solidarity Consortium, 2022 [7]	Europe Canada Latin America Asia Africa	14,221 total randomized 8,275 allocated 1:1 to remdesivir and control	Patients hospitalized with COVID-19 Follow-up time: up to Day 60	Remdesivir 200 mg IV on D1, followed by 100mg IV on D2 – D10 Other arms: Lopiravir/Ritonavir Hydroxychloroquine Interferon beta 1a	Standard of care	Mortality Use of mechanical ventilation Duration of hospitalization
Beigel, 2020 [8]	USA Denmark UK, Greece Germany Korea Mexico Spain Japan Singapore	1062 randomized, 1048 evaluated	Severe COVID-19 patients Follow-up time: up to Day 29	Remdesivir 200 mg IV on D1, followed by 100 mg IV on D2 – D10	Placebo	Clinical status (using 8-category ordinal scale) Time to recovery (1-2 category change from baseline) Mortality Adverse events
Ader, 2021 [9] Ader 2022 (Final	Austria Belgium France	857 randomized, 843 evaluated	Hospitalized COVID-19 patients requiring oxygen	Remdesivir 200 mg IV on D1, followed by 100mg	Standard of care	Clinical status on day 15 Viral load

results) [16]	Luxembourg Portugal		and/or ventilatory support Follow-up time: up to Day 90	IV on D2 – D10		Mortality Adverse events
Mahajan, 2021 [10]	India	82 randomized, 70 evaluated	Moderate to severe COVID-19 Follow-up time: up to Day 24	Remdesivir 200 mg IV on D1, followed by 100 mg on D2-D5	Standard of care	Clinical status on day 12 (6-point ordinal scale) Mortality Safety outcomes (liver and renal function tests)
Spinner, 2020 [11]	USA Europe UK Asia	596 randomized, 584 evaluated	Hospitalized patients with moderate COVID-19 Follow-up time: up to Day 28	Remdesivir 200 mg IV on D1, followed by 100 mg IV on D2 – D10 Remdesivir 200 mg IV on D1, followed by 100 mg on D2-D5	Standard of care	Clinical status on day 11 (7-point ordinal scale) Clinical improvement (2-category change from baseline) Time to recovery Adverse events
Barratt-Due, 2021 [12]	Norway	101 randomized, 83 completed 3 month follow up	Hospitalized adults with COVID-19 Follow-up time: up to Day 90	Remdesivir 200 mg IV on D1, followed by 100mg IV on D2 – D10	Standard of care	Mortality Need for mechanical ventilation ICU admission Viral load Adverse events
Abd-Elsalam, 2021 [13]	Egypt	209 randomized, 200 evaluated	Hospitalized mild to moderate patients Follow-up time: up to Day 28	Remdesivir 200 mg IV on D1, followed by 100mg IV on D2 – D10	Standard of care	Length of hospital stay Need for mechanical ventilation Adverse events
Gottlieb, 2021 [14]	United States Spain Denmark	584 randomized, 562 evaluated	Non-hospitalized patients with mild to moderate COVID-19	Remdesivir 200 mg IV on D1, followed by 100mg	Placebo	COVID-19 related hospitalization or death from any

	United Kingdom		with risk factors for progression to severe disease within 7 days of symptom onset Follow-up time: Up to Day 28	IV on D2 – D3		cause by Day 28 COVID-19 related medically attended visit or death from any cause by Day 28 Adverse events
Ali, 2022 [15]	Canada	1,282 randomized, 1,281 analyzed	Hospitalized patients with laboratory confirmed SARS-CoV-2 infection Follow up: 28 days	Remdesivir 200 mg IV on D0, followed by 100 mg IV on Day 1-9	Standard of care	Mortality, need for mechanical ventilation, hospital length of stay, clinical severity of illness (WHO ordinal scale), adverse events (hepatic dysfunction and need for renal replacement therapy)

Appendix 4: Detailed Study Appraisal

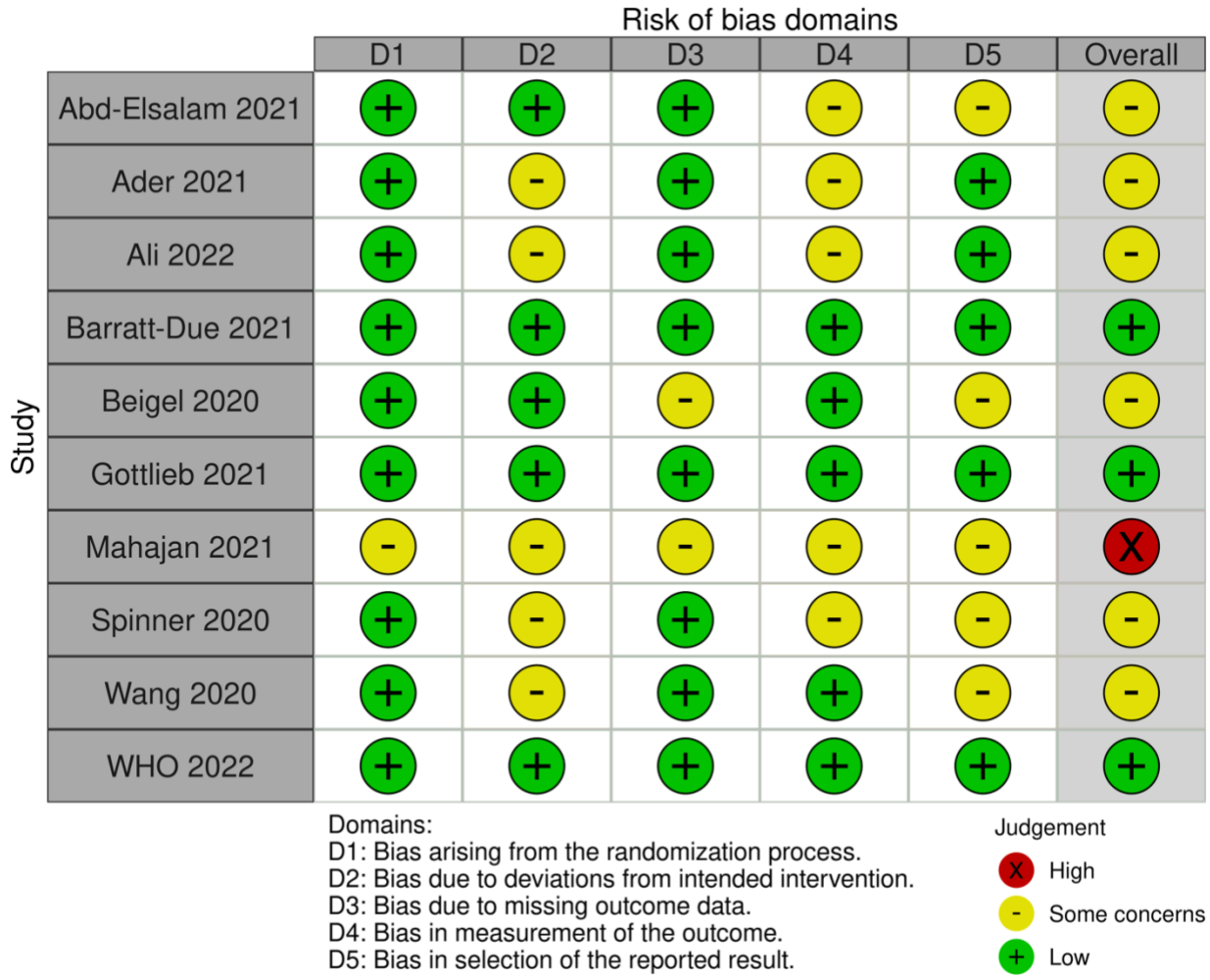

Figure 1. Detailed Study Appraisal

Appendix 5: GRADE Evidence Profile

Author(s): Carol Stephanie C. Tan Lim, MD, MSc

Question: Remdesivir compared to Placebo/Standard Care for COVID-19 hospitalized adult patients

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Remdesivir	Placebo/Standard Care	Relative (95% CI)	Absolute (95% CI)		
Mortality (Day 28)												
9	randomised trials	serious[a]	not serious	not serious	serious[b]	none	855/6452 (13.3%)	931/6187 (15.0%)	**RR 0.90** (0.83- 0.98)	**15 fewer per 1,000** (from 26 fewer to 3 fewer)	⊕⊕◯◯ Low	CRITICAL
Clinical improvement												
4	randomised trials	serious[c]	not serious	not serious	serious[b]	none	715/1024 (69.8%)	455/748 (60.8%)	**RR 1.07** (1.01-1.13)	**43 more per 1,000** (from 6 more to 79 more)	⊕⊕◯◯ Low	CRITICAL
Clinical deterioration												
5	randomised trials	serious[c]	not serious	not serious	not serious	none	189/1565 (12.1%)	229/1269 (18.0%)	**RR 0.75** (0.62-0.89)	**45 fewer per 1,000** (from 69 fewer to 20 fewer)	⊕⊕⊕◯ Moderate	CRITICAL
Need for mechanical ventilation												
5	randomised trials	serious[d]	serious[e]	not serious	not serious	none	704/5262 (13.4%)	859/5237 (16.4%)	**RR 0.72** (0.55-0.94)	**46 fewer per 1,000** (from 74 fewer to 10 fewer)	⊕⊕◯◯ Low	CRITICAL
Serious adverse events												
5	randomised trials	serious[f]	not serious	not serious	serious[g]	none	341/2139 (15.9%)	354/1870 (18.9%)	**RR 0.84** (0.65-1.09)	**30 fewer per 1,000** (from 66 fewer to 17 more)	⊕⊕◯◯ Low	CRITICAL
Adverse events												
5	randomised trials	serious[f]	not serious	not serious	not serious	none	941/2158 (43.6%)	790/1875 (42.1%)	**RR 0.99** (0.92-1.08)	**4 fewer per 1,000** (from 34 fewer to 34 more)	⊕⊕⊕◯ Moderate	IMPORTANT

Explanations

a. Issues with randomization, performance bias, detection bias, missing outcome data, and reporting bias in majority of studies
b. Upper or lower limit of confidence interval near no-effect value
c. 1 study with high risk of bias, the rest with overall some concerns for bias
d. 4 studies with overall some concerns for bias due to issues with deviation from intended intervention (2 studies), missing outcome data (1 study), outcome measurement bias (3 studies) and reporting bias (2 studies)
e. Significant heterogeneity
f. All studies with some concern for bias due to issues with deviation from intended intervention, missing outcome data, outcome measurement bias and reporting bias
g. Wide confidence interval

Author(s): Mary Christine Castro, MD,MSc, Carol Stephanie C. Tan Lim, MD, MSc
Question: Remdesivir compared to Placebo/Standard Care for non-hospitalized adult patients with COVID-19

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	remdesivir	placebo or standard of care	Relative (95% CI)	Absolute (95% CI)		
COVID-related hospitalization												
1	randomised trial	not serious	not serious	not serious	Serious[a]	none	2/279 (0.7%)	15/283 (5.3%)	**RR 0.13** (0.03-0.59)	**46 fewer per 1,000** (from 51 fewer to 32 fewer)	⊕⊕⊕◯ Moderate	CRITICAL
COVID-related medically attended visits by Day 28												
1	randomised trial	not serious	not serious	not serious	Serious[a]	none	4/246 (1.6%)	21/252 (8.3%)	**RR 0.19** (0.07-0.56)	**68 fewer per 1,000** (from 77 fewer to 37 fewer)	⊕⊕⊕◯ Moderate	IMPORTANT
All-cause hospitalization by Day 28												
1	randomised trials	not serious	not serious	not serious	Serious[a]	none	5/279 (1.8%)	18/283 (6.4%)	**RR 0.28** (0.10-0.75)	**46 fewer per 1,000** (from 57 fewer to 16 fewer)	⊕⊕⊕◯ Moderate	CRITICAL
Alleviation of symptoms by Day 14												
1	randomised trials	not serious	not serious	not serious	Serious[b]	none	23/66 (34.8%)	15/60 (25.0%)	**RR 1.41** (0.73-2.69)	**102 more per 1,000** (from 68 fewer to 423 more)	⊕⊕⊕◯ Moderate	IMPORTANT

Adverse events

1	randomised trials	not serious	not serious	not serious	Serious[b]	none	118/279 (42.3%)	131/283 (46.3%)	**RR 0.90** (0.75-1.09)	**46 fewer per 1,000** (from 116 fewer to 42 more)	⊕⊕⊕◯ Moderate	IMPORTANT

Serious adverse events

1	randomised trials	not serious	not serious	not serious	Serious[a]	none	5/279 (1.8%)	19/283 (6.7%)	**RR 0.26** (0.10-0.70)	**50 fewer per 1,000** (from 60 fewer to 20 fewer)	⊕⊕⊕◯ Moderate	CRITICAL

CI: confidence interval; **HR:** hazard Ratio; **RR:** risk ratio

Explanations
a. Study did not reach target sample size due to administrative reasons, small number of events not reaching optimal information size
b. Wide confidence interval

Author(s): Carol Stephanie C. Tan Lim, MD, MSc

Question: Remdesivir compared to Placebo/Standard Care for COVID-19 hospitalized pediatric patients

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Remdesivir	Placebo/Standard Care	Relative (95% CI)	Absolute (95% CI)		
Mortality (Day 28)												
9	randomised trials	serious[a]	not serious	serious[b]	serious[c]	none	855/6452 (13.3%)	931/6187 (15.0%)	**RR 0.90** (0.83-0.98)	**15 fewer per 1,000** (from 26 fewer to 3 fewer)	⨁◯◯◯ Very low	CRITICAL
Clinical improvement												
4	randomised trials	serious[d]	not serious	serious[b]	serious[c]	none	715/1024 (69.8%)	455/748 (60.8%)	**RR 1.07** (1.01-1.13)	**43 more per 1,000** (from 6 more to 79 more)	⨁◯◯◯ Very low	CRITICAL
Clinical deterioration												
5	randomised trials	serious[d]	not serious	serious[b]	not serious	none	189/1565 (12.1%)	229/1269 (18.0%)	**RR 0.75** (0.62-0.89)	**45 fewer per 1,000** (from 69 fewer to 20 fewer)	⨁⨁◯◯ Low	CRITICAL
Need for mechanical ventilation												
5	randomised trials	serious[e]	serious[f]	serious[b]	not serious	none	704/5262 (13.4%)	859/5237 (16.4%)	**RR 0.72** (0.55-0.94)	**46 fewer per 1,000** (from 74 fewer to 10 fewer)	⨁◯◯◯ Very low	CRITICAL
Serious adverse events												
5	randomised trials	serious[g]	not serious	serious[b]	serious[h]	none	341/2139 (15.9%)	354/1870 (18.9%)	**RR 0.84** (0.65-1.09)	**30 fewer per 1,000** (from 66 fewer to 17 more)	⨁◯◯◯ Very low	CRITICAL
Adverse events												
5	randomised trials	serious[g]	not serious	serious[b]	not serious	none	941/2158 (43.6%)	790/1875 (42.1%)	**RR 0.99** (0.92-1.08)	**4 fewer per 1,000** (from 34 fewer to 34 more)	⨁⨁◯◯ Low	IMPORTANT

Explanations

a. Issues with randomization, performance bias, detection bias, missing outcome data, and reporting bias in majority of studies
b. Studies done on adults
c. Upper or lower limit of confidence interval near no-effect value
d. 1 study with high risk of bias, the rest with overall some concerns for bias
e. 4 studies with overall some concerns for bias due to issues with deviation from intended intervention (2 studies), missing outcome data (1 study), outcome measurement bias (3 studies) and reporting bias (2 studies)
f. Significant heterogeneity
g. All studies with some concern for bias due to issues with deviation from intended intervention, missing outcome data, outcome measurement bias and reporting bias
h. Wide confidence interval

Author(s): Carol Stephanie C. Tan Lim, MD, MSc
Question: Remdesivir compared to Placebo/Standard Care for non-hospitalized pediatric patients with COVID-19

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	remdesivir	placebo or standard of care	Relative (95% CI)	Absolute (95% CI)		
COVID-related hospitalization												
1	randomised trial	not serious	not serious	serious[a]	Serious[b]	none	2/279 (0.7%)	15/283 (5.3%)	**RR 0.13** (0.03-0.59)	**46 fewer per 1,000** (from 51 fewer to 32 fewer)	⨁⨁◯◯ Low	CRITICAL
COVID-related medically attended visits by Day 28												
1	randomised trial	not serious	not serious	serious[a]	Serious[b]	none	4/246 (1.6%)	21/252 (8.3%)	**RR 0.19** (0.07-0.56)	**68 fewer per 1,000** (from 77 fewer to 37 fewer)	⨁⨁◯◯ Low	IMPORTANT
All-cause hospitalization by Day 28												
1	randomised trials	not serious	not serious	serious[a]	Serious[b]	none	5/279 (1.8%)	18/283 (6.4%)	**RR 0.28** (0.10-0.75)	**46 fewer per 1,000** (from 57 fewer to 16 fewer)	⨁⨁◯◯ Low	CRITICAL
Alleviation of symptoms by Day 14												

1	randomised trials	not serious	not serious	serious[a]	Serious[c]	none	23/66 (34.8%)	15/60 (25.0%)	**RR 1.41** (0.73-2.69)	**102 more per 1,000** (from 68 fewer to 423 more)	⊕⊕◯◯ Low	IMPORTANT

Adverse events

1	randomised trials	not serious	not serious	serious[a]	Serious[c]	none	118/279 (42.3%)	131/283 (46.3%)	**RR 0.90** (0.75-1.09)	**46 fewer per 1,000** (from 116 fewer to 42 more)	⊕⊕◯◯ Low	IMPORTANT

Serious adverse events

1	randomised trials	not serious	not serious	serious[a]	Serious[b]	none	5/279 (1.8%)	19/283 (6.7%)	**RR 0.26** (0.10-0.70)	**50 fewer per 1,000** (from 60 fewer to 20 fewer)	⊕⊕◯◯ Low	CRITICAL

CI: confidence interval; **HR:** hazard Ratio; **RR:** risk ratio

Explanations

a. Study included only 8 patients aged 12-18 years old
b. Study did not reach target sample size due to administrative reasons, small number of events not reaching optimal information size
c. Wide confidence interval

Appendix 6: Forest Plots

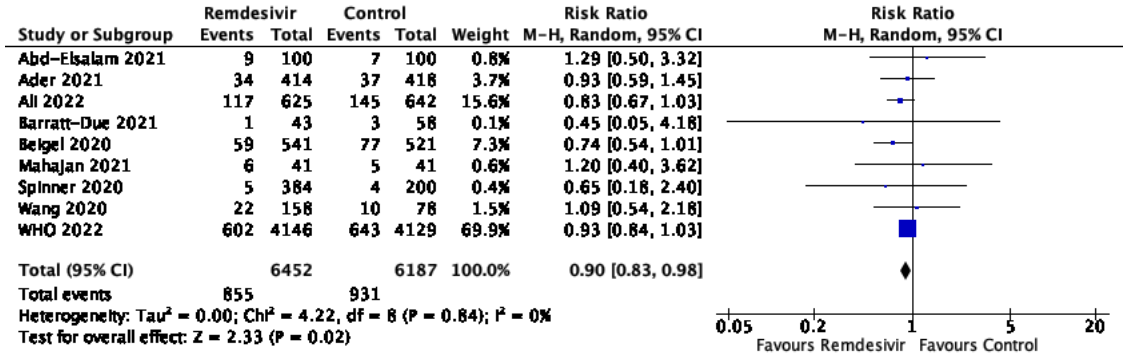

Figure 2. Pooled effect of remdesivir on all-cause mortality at Day 28 among hospitalized patients

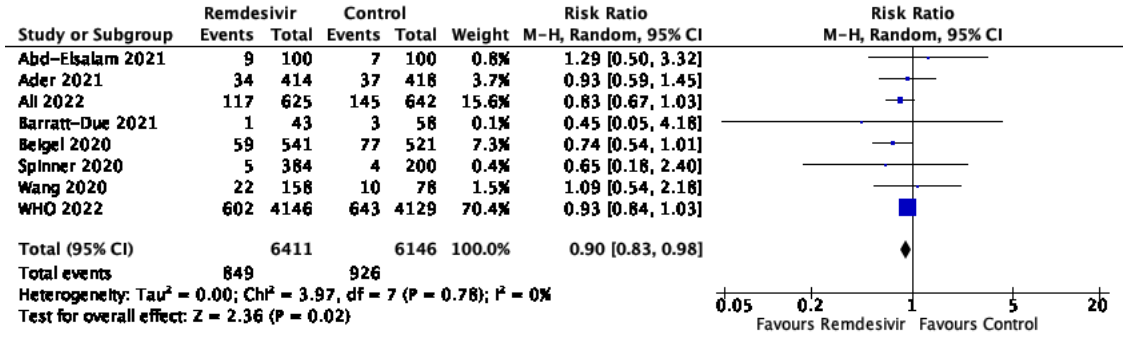

Figure 2a. Pooled effect of remdesivir on all-cause mortality at Day 28 among hospitalized patients (sensitivity analysis excluding studies with very serious risk of bias)

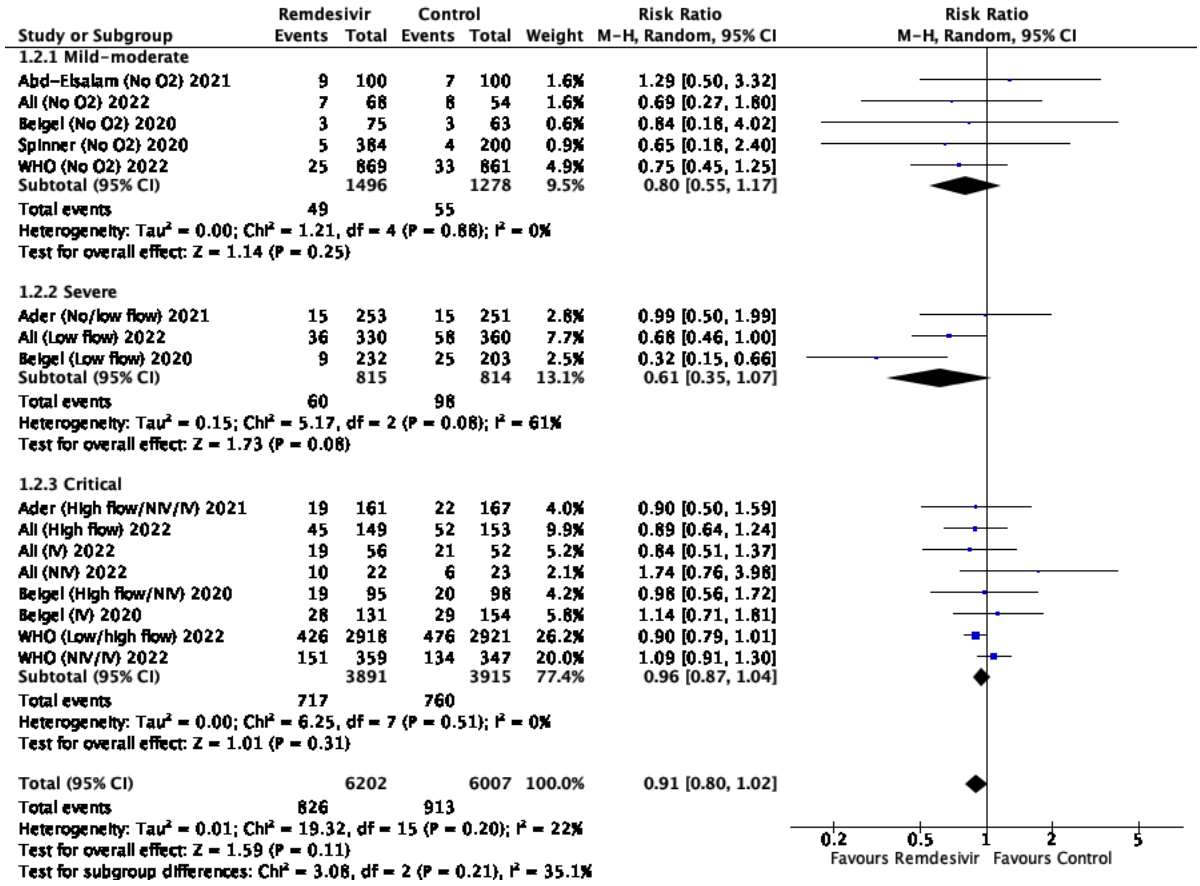

Figure 3. Subgroup analysis for mortality by disease severity

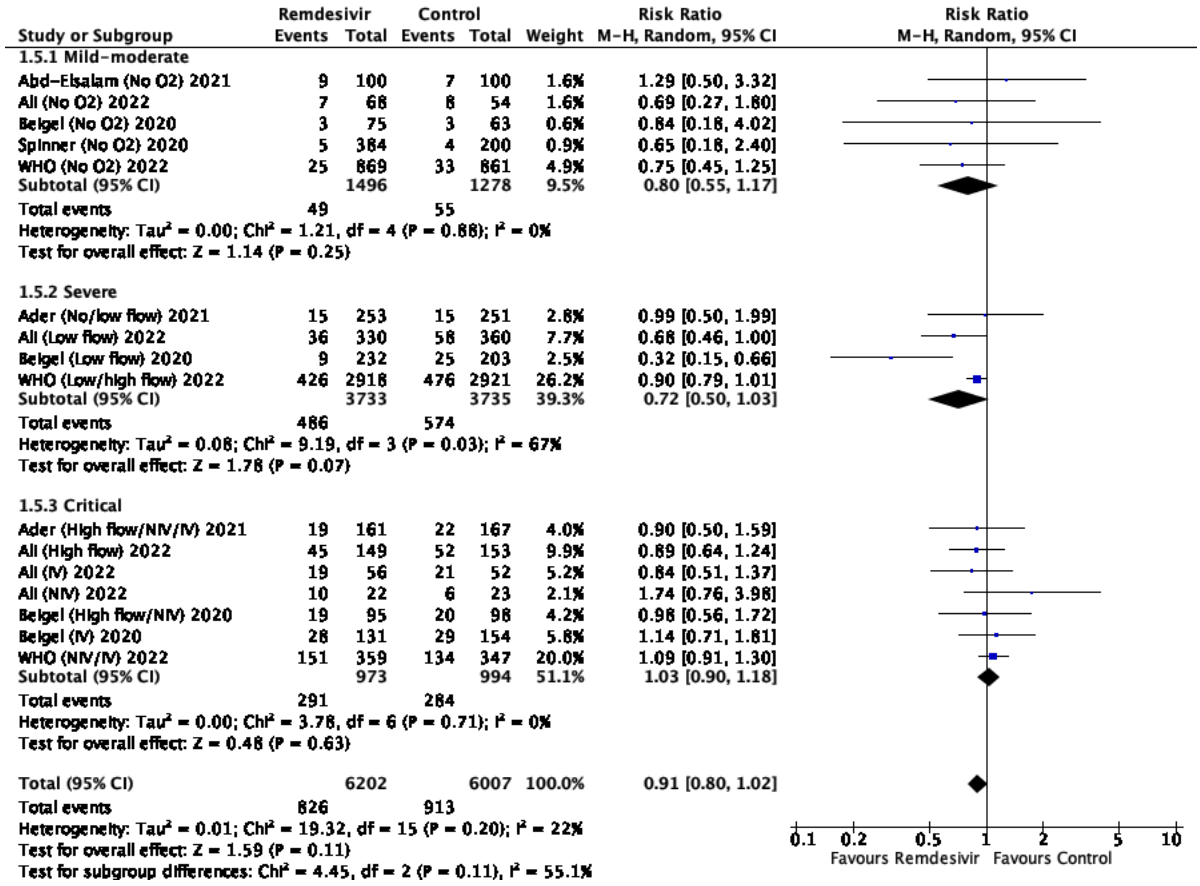

Figure 3a. Sensitivity analysis for the subgroup analysis for mortality by disease severity (WHO low/high flow oxygen placed in the severe subgroup)

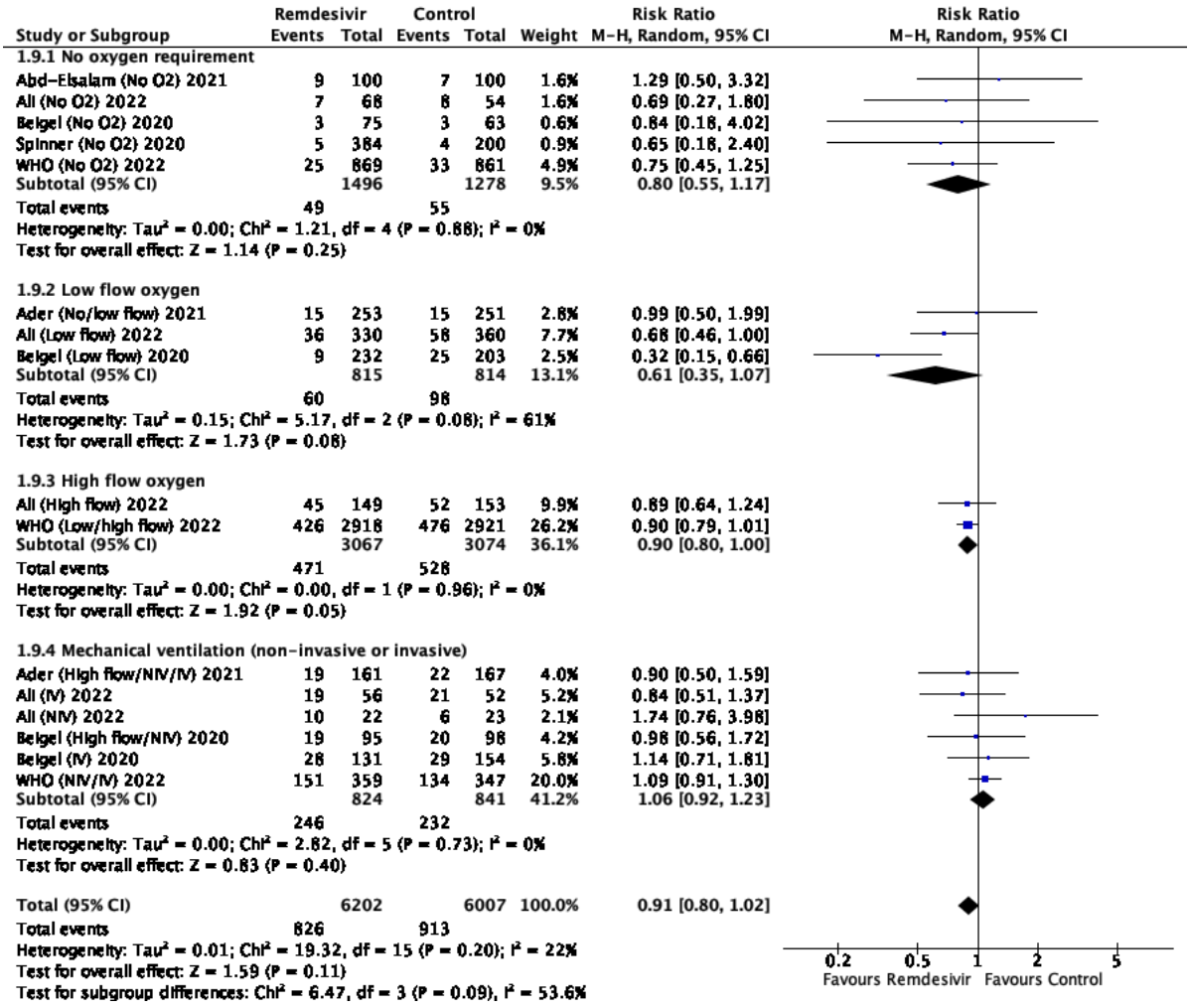

Figure 4. Subgroup analysis for mortality by oxygen requirement

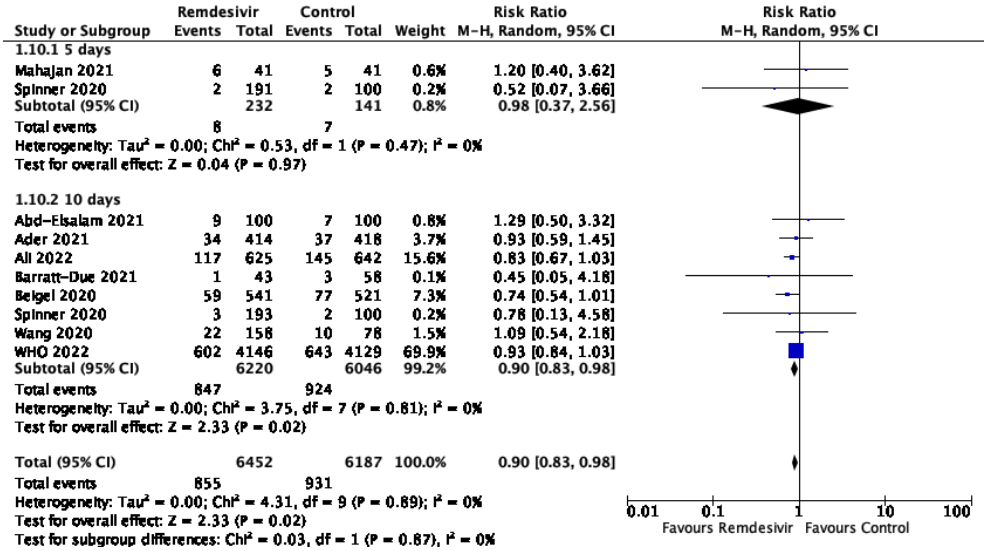

Figure 5. Subgroup analysis for mortality by treatment duration

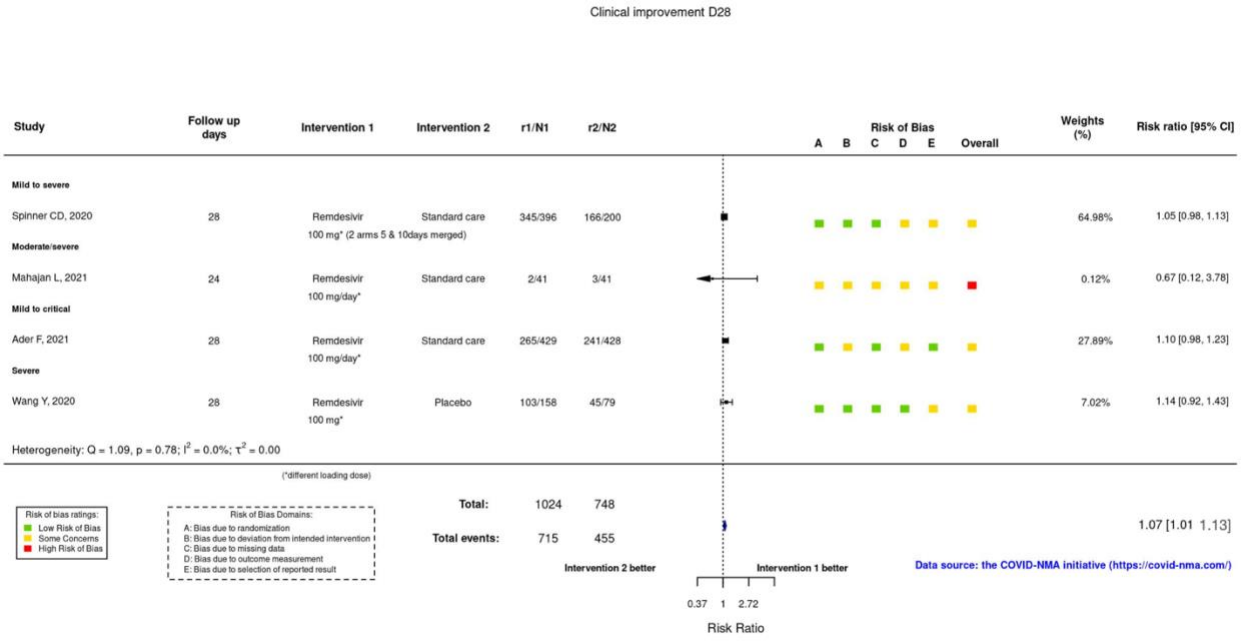

Figure 6. Pooled effect of remdesivir on clinical improvement up to Day 28 among hospitalized patients
(Source: https://www.covid-nma.com)

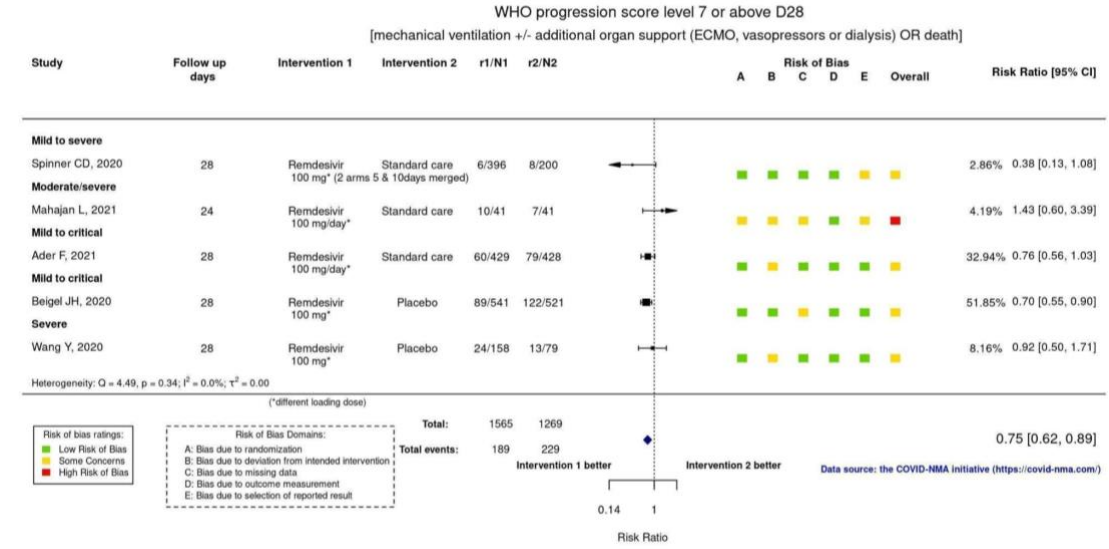

Figure 7. Pooled effect of remdesivir on clinical deterioration using the WHO progression score among hospitalized patients
(Source: https://www.covid-nma.com)

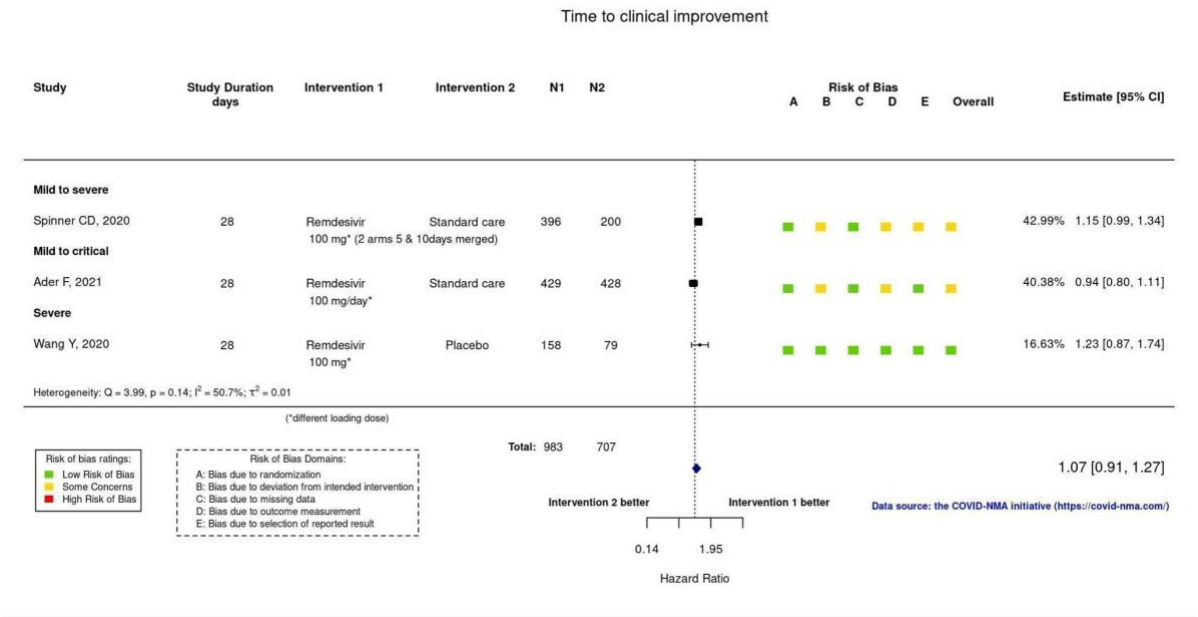

Figure 8. Pooled effect of remdesivir on time to clinical improvement among hospitalized patients (Source: https://www.covid-nma.com)

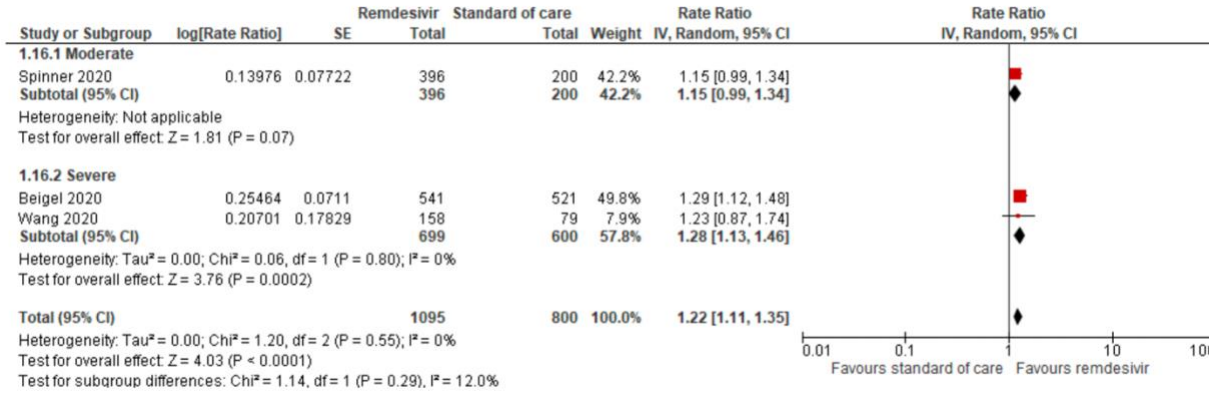

Figure 9. Pooled effect of remdesivir on recovery rate among hospitalized patients

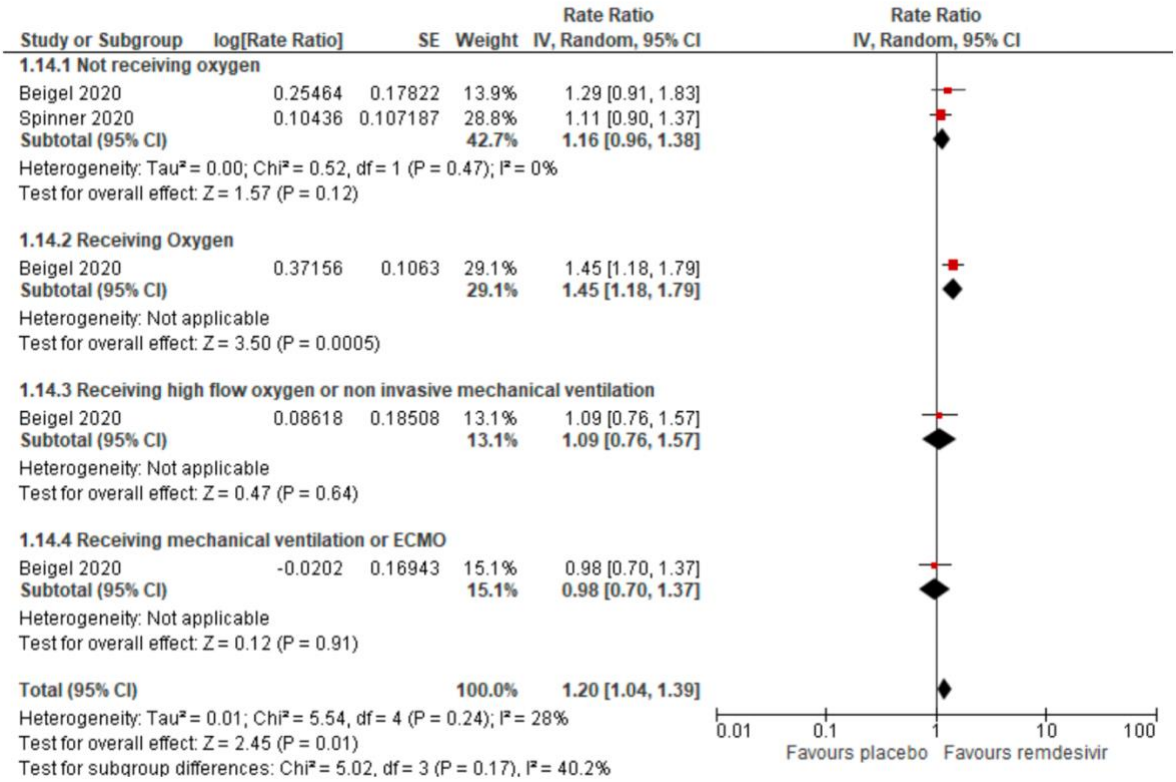

Figure 10. Subgroup analysis according to oxygen requirement on recovery rate among hospitalized patients

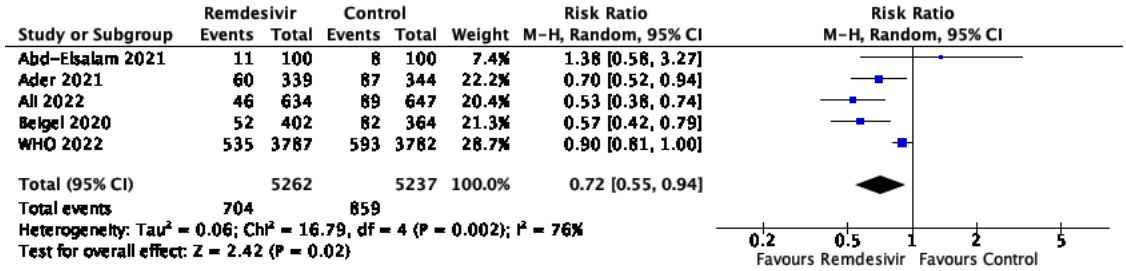

Figure 11. Pooled effect of remdesivir on need for mechanical ventilation among hospitalized patients

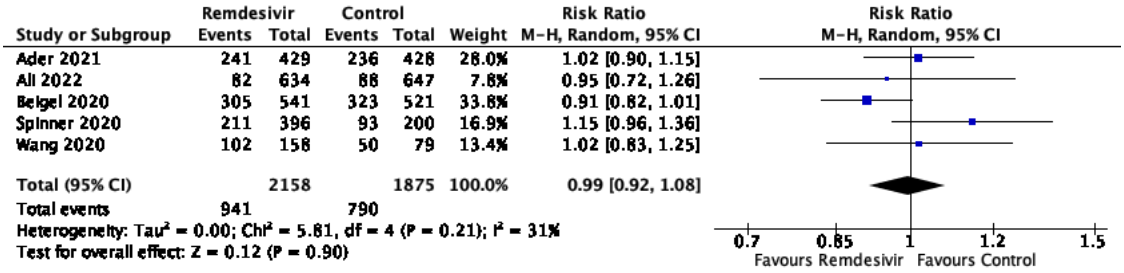

Figure 12. Pooled effect of remdesivir on adverse events among hospitalized patients

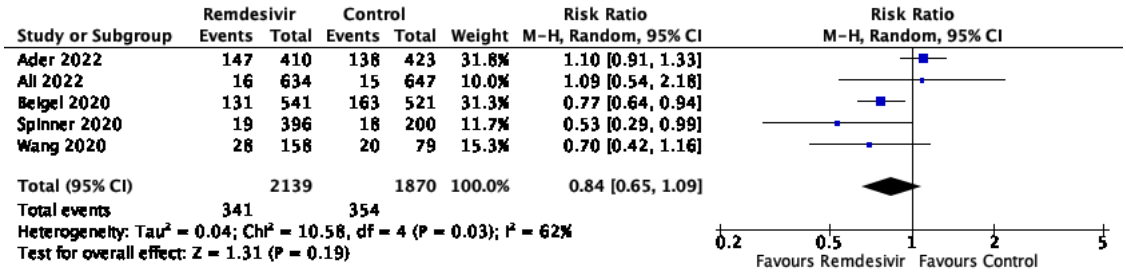

Figure 13. Pooled effect of remdesivir on serious adverse events among hospitalized patients

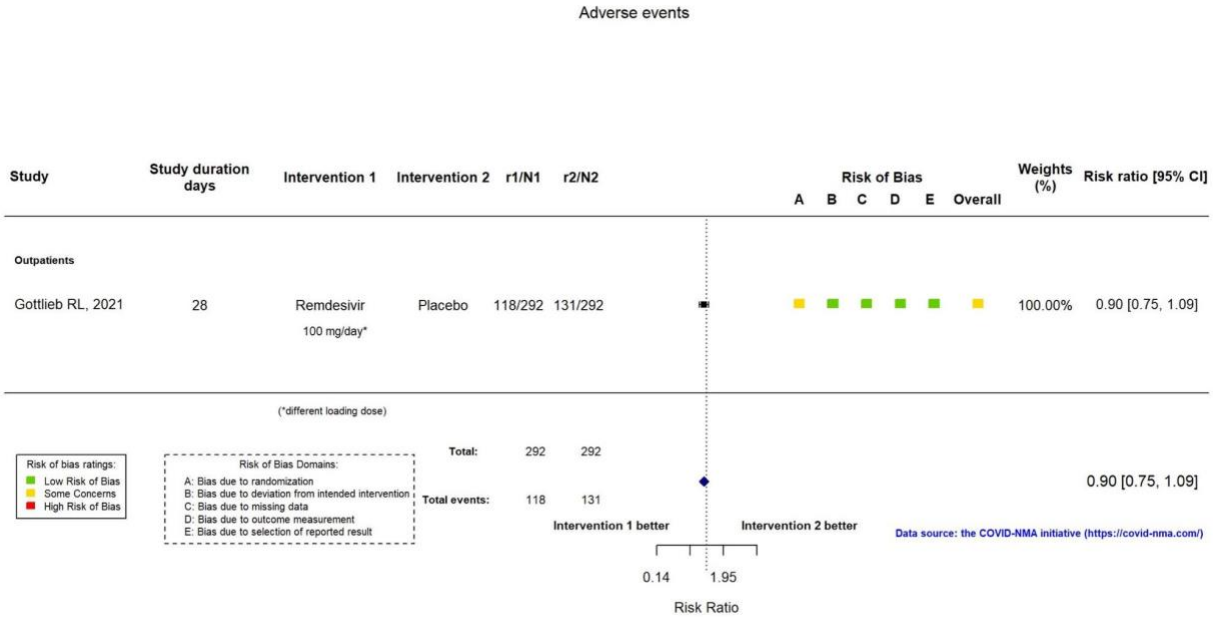

Figure 14. Pooled effect of remdesivir on adverse events among outpatients
(Source: https://www.covid-nma.com)

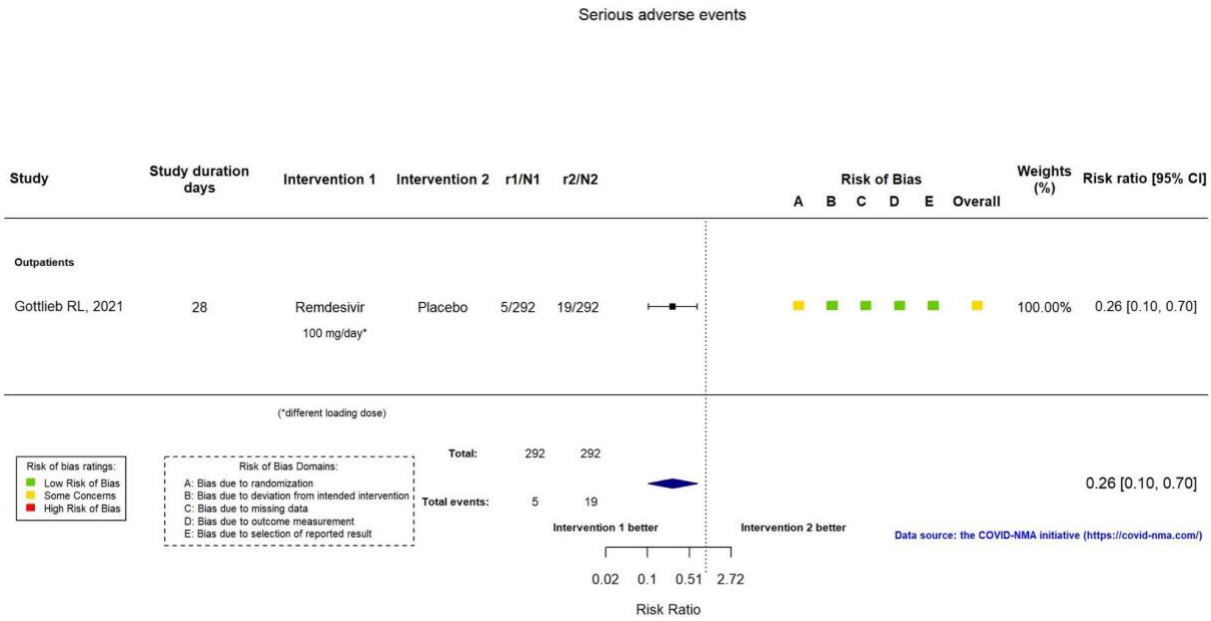

Figure 15. Pooled effect of remdesivir on serious adverse events among outpatients
(Source: https://www.covid-nma.com)

Appendix 7: Table of Ongoing Studies

No.	Study Title	Interventions	Status
1	Factorial Randomized Trial of Remdesivir and Baricitinib Plus Dexamethasone for COVID-19 (the AMMURAVID Trial)	Drug: Baricitinib Oral Tablet [Olumiant] Drug: Remdesivir Drug: Dexamethasone	Not yet recruiting
2	IFN-beta 1b and Remdesivir for COVID19	Drug: Interferon beta-1b Drug: Remdesivir	Recruiting
3	Study to Evaluate the Safety, Tolerability, Pharmacokinetics, and Efficacy of Remdesivir (GS-5734™) in Participants From Birth to < 18 Years of Age With Coronavirus Disease 2019 (COVID-19)	Drug: Remdesivir	Recruiting
4	Remdesivir in COVID-19 Lahore General Hospital	Drug: Remdesivir	Recruiting
5	Remdesivir, Long-covid and Quality of Life	Drug: Remdesivir	Recruiting
6	Baricitinib in Hospitalized Covid-19 Patients With Diabetes Mellitus	Drug: Baricitinib Drug: Dexamethasone Drug: Remdesivir	Recruiting
7	Efficacy of Remdesivir and Baricitinib for the Treatment of Severe COVID 19 Patients	Drug: Remdesivir Drug: Baricitinib Drug: Tocilizumab	Recruiting
8	Efficacy of Favipiravir in Treatment of Mild & Moderate COVID-19 Infection in Nepal	Drug: Favipiravir Drug: Placebo Drug: Remdesivir	Recruiting
9	ACTIV-5 / Big Effect Trial (BET-C) for the Treatment of COVID-19	Drug: Danicopan Other: Placebo Drug: Remdesivir	Recruiting
10	Comparative Therapeutic Efficacy and Safety of Different Antiviral and Anti Inflammatory Drugs in COVID-19 Patients.	Drug: Remdesivir Drug: Hydroxychloroquine Drug: Tocilizumab Drug: Lopinavir/ Ritonavir Drug: Ivermectin	Recruiting
11	Safety, Tolerability and Pharmacokinetics of Inhaled Nanoparticle Formulation of Remdesivir (GS-5734) and NA-831	Drug: NA-831 Drug: Placebo Drug: GS-5734 Combination Product: Drugs: NA-831 plus GS-5734	Recruiting
12	Treatment of Moderate to Severe Coronavirus Disease (COVID-19) in Hospitalized Patients	Drug: Baricitinib Drug: Remdesivir + baricitinib Drug: Remdesivir Drug: Tocilizumab	Recruiting
13	Trial of Treatments for COVID-19 in Hospitalized Adults	Drug: Remdesivir Drug: Lopinavir/ritonavir Drug: Interferon Beta-1A Drug: Hydroxychloroquine	Recruiting

		Other: Standard of care Drug: AZD7442 Other: Placebo	
14	ACTIV-3b: Therapeutics for Severely Ill Inpatients With COVID-19	Biological: Remdesivir Drug: Remdesivir Placebo Biological: Aviptadil Drug: Aviptadil Placebo Drug: Corticosteroid	Recruiting
15	Austrian CoronaVirus Adaptive Clinical Trial (COVID-19)	Drug: Chloroquine or Hydroxychloroquine Drug: Lopinavir/Ritonavir Other: Best standard of care Drug: Rivaroxaban Drug: Thromboprophylaxis Drug: Candesartan Drug: non-RAS blocking antihypertensives Drug: Remdesivir Drug: Asunercept 400mg Drug: Asunercept 100mg Drug: Asunercept 25mg Drug: Pentaglobin	Recruiting
16	Trial to Determine the Efficacy/Safety of Plitidepsin vs Control in Patients With Moderate COVID-19 Infection	Drug: Plitidepsin Drug: Dexamethasone Drug: Remdesivir	Recruiting
17	I-SPY COVID-19 TRIAL: An Adaptive Platform Trial for Critically Ill Patients	Drug: Remdesivir Drug: Pulmozyme Drug: IC14 Drug: Celecoxib Famotidine Drug: Narsoplimab Drug: Aviptadil Acetate Drug: Cyclosporine	Recruiting
18	Finding Treatments for COVID-19: A Trial of Antiviral Pharmacodynamics in Early Symptomatic COVID-19 (PLATCOV)	Drug: Favipiravir Drug: Monoclonal antibodies Drug: Ivermectin Other: No treatment Drug: Remdesivir	Recruiting
19	Assessment of utility of Remdesivir in Patients with Acute Kidney Injury or Chronic Kidney Disease in admitted COVID-19 patients	Drug: Remdesivir	Recruiting
20	REMdesivir-HU Clinical Study and Severe Covid-19 Patients	Drug: Remdesivir-HU	Not recruiting
21	Study to Evaluate the Efficacy and Safety of Remdesivir in Participants With Severely Reduced Kidney Function Who Are Hospitalized for Coronavirus Disease 2019 (COVID-19)	Drug: Remdesivir	Not recruiting
22	ACTIV-5 / Big Effect Trial (BET-B) for the Treatment of COVID-19	Biological: Lenzilumab Drug: Remdesivir	Not recruiting
23	SARS-CoV-2 Human Challenge Characterisation Study	Drug: Remdesivir	Not recruiting

24	ACTIV-3: Therapeutics for Inpatients With COVID-19	Biological: LY3819253 Drug: Placebo Biological: Remdesivir Biological: VIR-7831 Biological: BRII-196/BRII-198 Biological: AZD7442 Drug: MP0420	Not recruiting
25	Antiviral Activity and Safety of Remdesivir in Bangladeshi Patients With Severe Coronavirus Disease (COVID-19)	Drug: Remdesivir	Completed
26	Efficacy and Safety of Remdesivir and Tociluzumab for the Management of Severe COVID-19: A Randomized Controlled Trial	Drug: Remdesivir Drug: Tocilizumab	Completed
27	Study in Participants With Early Stage Coronavirus Disease 2019 (COVID-19) to Evaluate the Safety, Efficacy, and Pharmacokinetics of Remdesivir Administered by Inhalation	Drug: Remdesivir	Completed
28	Remdesivir Efficacy In Management Of COVID-19 Patients	Drug: Remdesivir	Completed
29	Effectiveness of Remedesvir in COVID-19 Patients Presenting at Mayo Hospital Lahore	Drug: Remdesivir	Completed
30	ACTIV-5 / Big Effect Trial (BET-A) for the Treatment of COVID-19	Other: Placebo Drug: Remdesivir Biological: Risankizumab	Completed
31	Adaptive COVID-19 Treatment Trial 4 (ACTT-4)	Drug: Baricitinib Drug: Dexamethasone Other: Placebo Drug: Remdesivir	Completed
32	The Efficacy of Different Anti-viral Drugs in COVID 19 Infected Patients	Drug: Hydroxychloroquine Drug: Remdesivir Other: (Standard of Care) SoC	Unknown
33	Study to Evaluate the Safety, Tolerability, Pharmacokinetics, and Efficacy of Remdesivir (GS-5734™) in Participants From Birth to < 18 Years of Age With Coronavirus Disease 2019 (COVID-19) (CARAVAN)	Drug: Remdesivir	Recruiting